CTX 40–4

40 Channel PLL-Synthesized CB Mobile Transceiver with 4 Channel VHF/FM Weather Monitor

- Full 40 Channel capability
- Powerful 4 Watt Transmitter
- Large LED Channel Readout
- 4 VHF marine weather channels
- Detachable microphone

The Cybernet CTX 40-4 is a combination transmitter and receiver designed for use in Class D operation in the 27 MHz citizens radio service. It is designed to meet the Federal Communications Commission requirements applicable to equipment in this service under Class D emission, and is not to be used for any other purpose. Rules part 95 of the FCC regulations defines operation in this service and the licensee is required to read and understand these regulations prior to operating a CB transmitter.
A station license must be applied for by submitting a properly completed station license application, FCC form 505, as directed. You may operate your CB radio under a temporary permit while your regular license application is being processed by the FCC by completing FCC form 555-B as directed. This form, when filled in, becomes your temporary permit and is valid for 60 days from the date you mailed the form 505 to the FCC. Do not mail the temporary permit – keep it in your possession until you receive notification from the FCC that your regular license application has been approved.
The unit will provide efficient and reliable radio communication in its intended application if installed and operated in accordance with instructions contained herein.

General Description
The CTX 40-4 citizens band radio was designed with the mariner in mind. It is equipped with all 40 channels plus 4 VHF marine band weather channels for continuous monitoring of weather channels. Compact and rugged it is ideally suited for recreational and commercial verssels requiring a heavy duty CB. The CTX 40-4 employs the very latest technology to provide 40 channels of operation by means of digital frequency synthesis with the phase-locked loop (PLL) circuitry. The use of PLL circuitry assures a precise on-frequency operation on every channel in both transmit and receive modes that is unmatched by conventional crystal frequency synthesis.

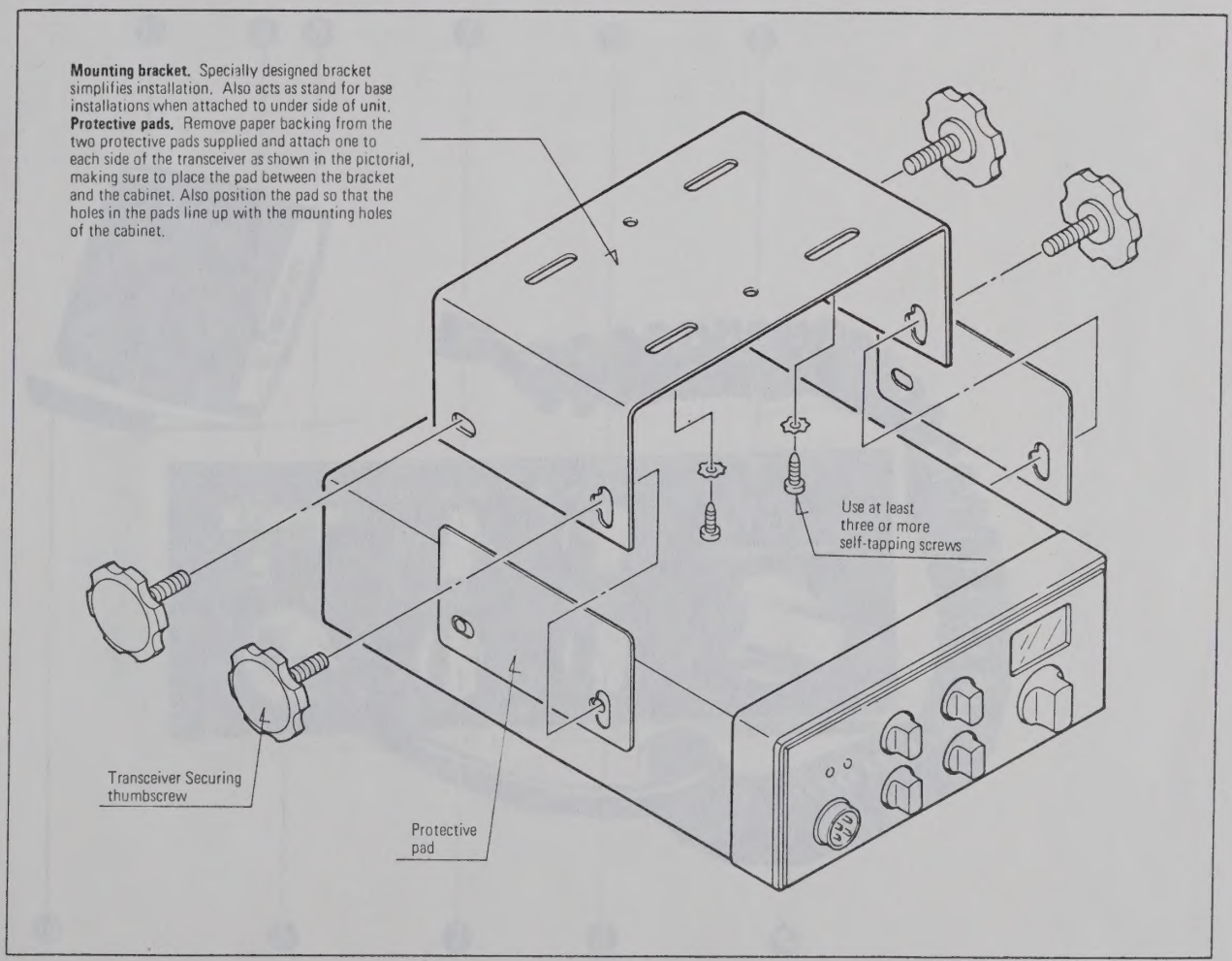
Mobile Installation

DC Power Connections. Caution: As supplied, the unit is wired to operate from a battery source of 11.5 to 14.5 volts DC, on negative ground systems. Connecting the unit to a positive ground vehicle or boat will severely damage the transceiver. Before making any power connections you must determine whether the vehicle or boat has a negative or positive ground electrical system.

Connect the fused power lead **(red)** of the DC power cord to the positive or hot side of the electrical system. Points normally available for this purpose are the accessory post on the ignition switch, the voltage regulator side of the ammeter or the accessory side of the fuse block. The other lead **(black)** should be connected to the negative or ground side of the electrical system.

Transceiver Mounting. Before installing the transceiver in a Boat, Car, Truck, etc., be sure to choose a location which is convenient to the operating controls, and will not interfere with the normal functions of the driver. The transceiver may be mounted, by means of the special bracket that is supplied with the transceiver. Attach the bracket by using three or more self-tapping screws (see picture). Secure the transceiver to the bracket by means of the large thumbscrews.

Attaching the Power Cord to the Transceiver. The plug at the end of the DC power cord is attached to the socket at the rear of the transceiver. Notice that the pins are unequally spaced, allowing the plug to be inserted only in one direction.


Mounting bracket. Specially designed bracket simplifies installation. Also acts as stand for base installations when attached to under side of unit.
Protective pads. Remove paper backing from the two protective pads supplied and attach one to each side of the transceiver as shown in the pictorial, making sure to place the pad between the bracket and the cabinet. Also position the pad so that the holes in the pads line up with the mounting holes of the cabinet.
Use at least three or more self-tapping screws
Transceiver Securing thumbscrew
Protective pad

Antenna Connection. The antenna lead-in cable (type RG58/U or RG8/U) should be terminated with a PL-259 type male coaxial connector which should then be attached to the matching SO-239 connector at the rear of the transceiver.

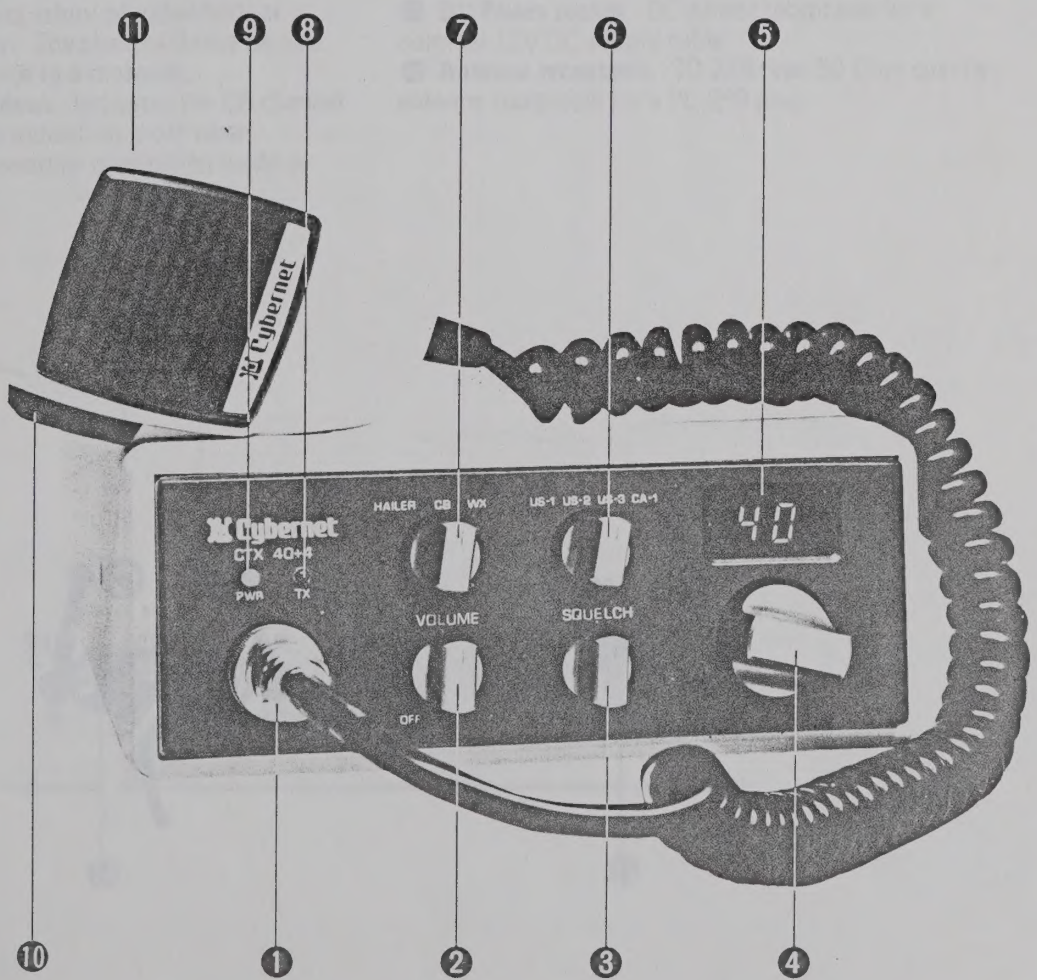
Base Station Installation

As supplied, the unit is designed to operate from a nominal 12 volts DC battery source. For AC operation (house current), an AC-to-DC power supply unit is required. The DC power output cable from the power supply unit should be plugged into the DC power socket on the transceiver. The AC line cord from the power supply unit should be connected to an outlet supplying 105–120 volts, 50 or 60 Hz AC.

Ignition Interference

Your transceiver is equipped with a full-time automatic noise limiter designed to provide efficient reduction of ignition noise. Ignition interference should not therefore be a problem in most cases. However, sufficient noise may be generated by some vehicles or boats to make it necessary to install additional suppression. Several noise suppressor kits are available which include all necessary parts and instructions. Alternatively, you can take the vehicle or boat to a skilled radio technician who will be able to carry out the suppression for you.

Function of Controls and Connectors



❶ **Microphone jack.** Accepts plug from the microphone supplied. Align the key properly then rotate screw-ring to secure the plug to socket.

❷ **Off/Volume control.** Turns the power on and controls the sound output from the built-in or external speaker. To switch the unit off, rotate the control counterclockwise until a click is heard.

❸ **Squelch control.** Quiets the receiver section when signals are not being received and thus allows quiet standby. To adjust the squelch, start to rotate the control from counterclockwise position until the receiver is just quieted when no signal is being received. Incoming signals will automatically defeat the squelch and be heard. Careful adjustment will be necessary since setting the control too far clockwise will not allow weaker signals to overcome the squelch action.

❹ **Channel selector.** Selects any one of the 40 CB channels desired. The selected channel is digitally displayed in the window above the selector. Channels 1 through 8 and 10 through 40 may be used for communications between stations operating under the same license. Channel 9 has been reserved by the FCC for emergency communications involving the immediate safety of individuals or protection of property. The channel 9 may be also used to render assistance to a motorist.

❺ **Digital channel readout.** Indicates the CB channel selected. The channel indication is off when operating the unit in weather monitoring mode or hailer mode.

❻ **Weather broadcast channel selector.** When the Hailer/CB/WX switch (7) is placed in the WX position, it allows the selection of one of 4 weather broadcast channels.

US-1. NOAA weather, 162.550 MHz.
US-2. NOAA weather, 162.400 MHz.
US-3. NOAA weather, 162.475 MHz.
CA-1. Canada weather, 161.650 MHz.

❼ **Hailer/CB/WX selector.** Selects the mode of the CTX 40-4.

Hailer. The unit operates as a hailer.
CB. Operates as a normal CB transceiver.
WX. The unit operates to receive one of 4 weather channels.

❽ **TX (red) lamp.** Lights up when transmitting CB.

❾ **Power (green) lamp.** Lights up when power is on.

❿ **Microphone switch.** In CB operation, depressing the switch will automatically switch the transceiver into its transmit mode.

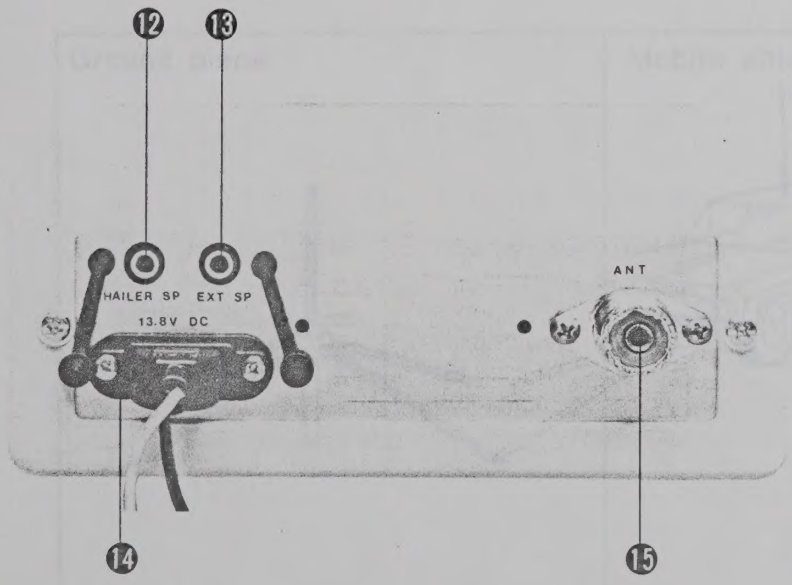
⓫ **Microphone.**

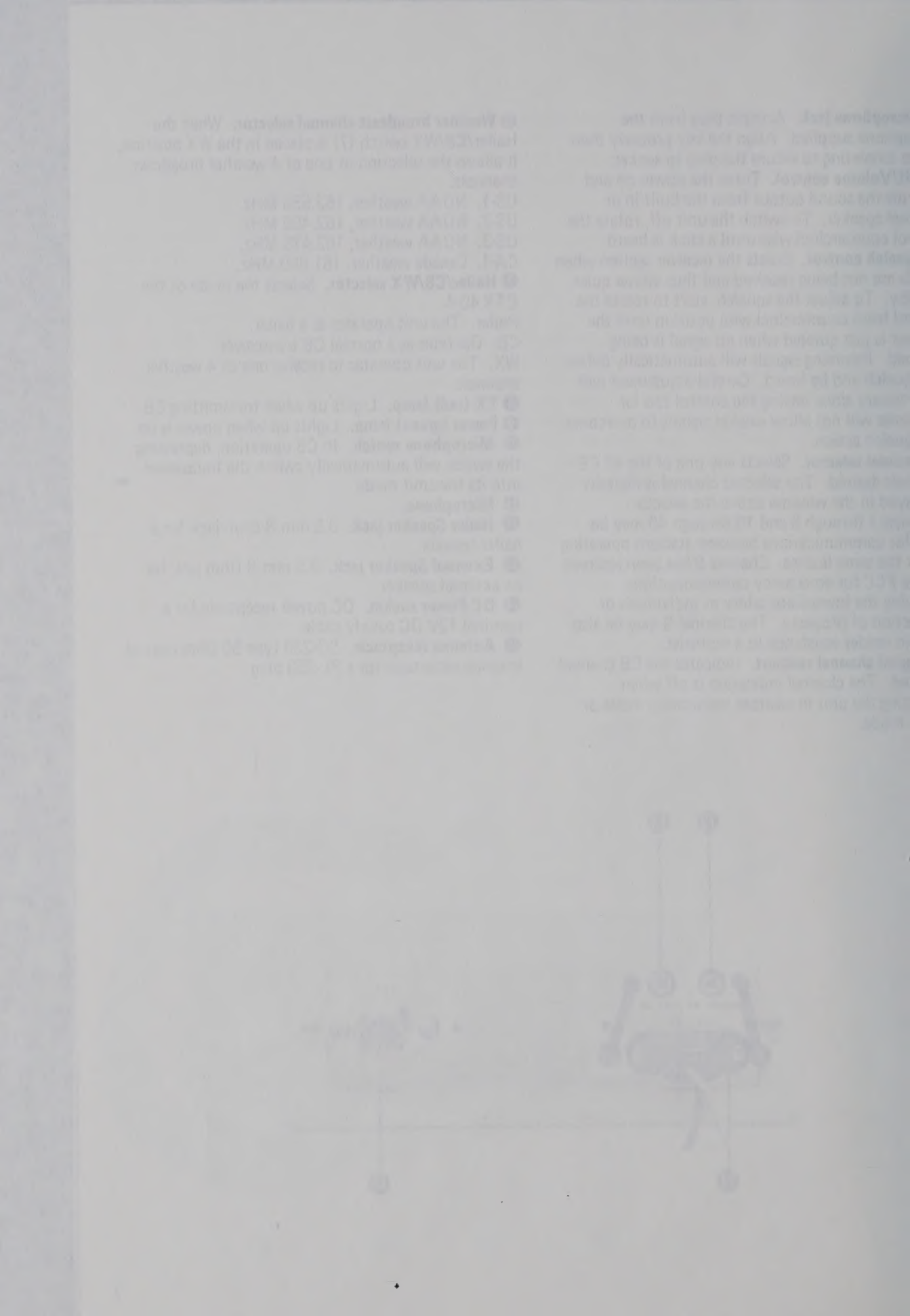
⓬ **Hailer Speaker jack.** 3.5 mm 8 Ohm jack for a hailer speaker.

⓭ **External Speaker jack.** 3.5 mm 8 Ohm jack for an external speaker.

⓮ **DC Power socket.** DC power receptacle for a nominal 12V DC supply cable.

⓯ **Antenna receptacle.** SO-239 type 50 Ohm coaxial antenna receptacle for a PL-259 plug.





Antennas

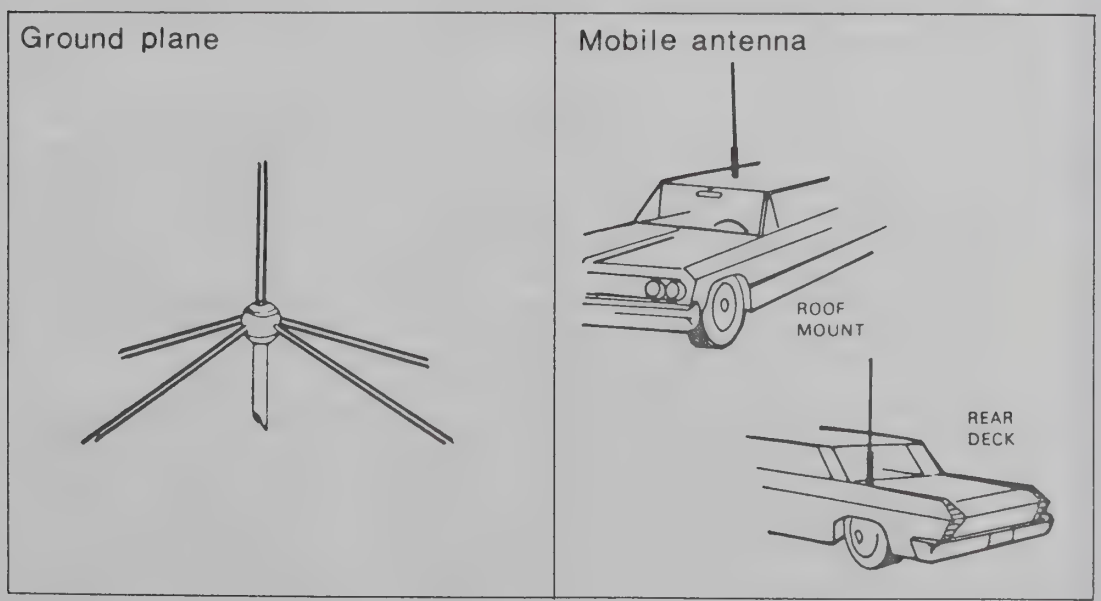
The receiving capabilities with your new transceiver will be greatly determined by the efficiency of the antenna system used. Due to the complexity of the subject, it is not within the scope of this manual to provide detailed information on antenna systems, although this section does contain some general information which may be of value:

Marine Antenna and Installation. The antenna system for a boat requires a ground plane antenna. The common name for such an antenna is coaxial ground plane antenna. The boat ground system which usually consists of a ground plate is not efficient in VHF or UHF and therefore, should not be relied upon for use with a simple whip antenna. This does not apply where the boat is of all-metal construction.
The same bonding and ignition suppression techniques must be applied to a boat as to an automobile. In many cases a boat requires more work because the engine compartment is of wood construction whereas an automobile has a metal hood and firewall to shield the engine. A boat's wooden engine compartment requires copper mesh shielding that is adequately connected to a bonded electrical system.
Bonding a boat requires that electrical and metal fittings be interconnected together and then connected to the engines. The propeller shaft can be bonded to the engine with the use of a spring steel wiper and all other fittings can be bonded to the engine using 2 inch wide copper strips.
The engine should then be connected to a hull bottom ground plate or ground tube, again using the same copper strip.

Antenna Cable. RG58/U or RG8/U should be used as the antenna lead-in cable. For optimum results, the length of antenna cable should be made as short as possible. The antenna lead-in cable (RG58/U or RG8/U) should be terminated with a PL-259 type male coaxial connector which should then be attached to the matching SO-239 connector at the rear of the transceiver.

Base Antennas. In a base station installation, an exceptionally long lead-in cable may be required. When lengths of over 50 feet are necessary, RG8/U coaxial cable is more suitable since it offers lower signal loss than RG58/U.

Mobile Antennas. The type of antenna best suited for mobile service is a vertically polarized nondirectional whip antenna. This type uses the metal body of the vehicle as a around plane effect for the antenna. There are number of locations that may be used for the installation of antenna. Two of the most popular locations are those illustrated below.
For best results, the vertical whip antenna should be mounted on the roof-top of the vehicle. Mounting the antenna on the trunk-lid of the vehicle is a method that is also used but somewhat less efficient than the roof-top mounting.



Operating Instructions

Never attempt to transmit without an antenna connected to the transceiver.

Receiver Operation. Rotate the Squelch control to the extreme counter-clockwise position and select the desired channel. Rotate the volume control knob until the switch operates. Advance the Volume control to about 1/3 setting. Since the transceiver is fully transistorized, operation will be instantaneous. Adjust to a comfortable listening level. The receiver is now ready to operate.

Squelch Adjustment. The Squelch control is used to eliminate any annoying background noise when no signals are present. To adjust the Squelch control properly during reception, turn up Volume control until background noise is heard (no signals should be present). Rotate the Squelch slowly clockwise until the background noise just disappears. At this point, the receiver will be quiet under no-signal conditions, but an incoming signal will overcome the squelch action and be heard. Since this control is variable, it can be used to provide varying degrees of sensitivity to incoming signals. As the control is advanced (from counterclockwise position), the squelch action is progressively increased and progressively stronger incoming signals are needed to overcome it. To receive extremely weak signals or to disable the squelch circuit, simply turn the control fully counterclockwise.
Note: In areas of high noise, you may have to slightly increase the setting of the Squelch control in order to achieve a quiet condition. However, under these conditions an extremely weak signal may not be able to overcome the squelch action and will not be heard. If severe noise is generated by your own vehicle or boat, proper vehicle or boat ignition suppression should be carried out.

External Speaker Jack. The recommended plug for the EXT SP jack is a 3.5 mm, subminiature phone plug, available from your dealer. The impedance of earphones or speakers connected to this jack should be 8 ohms. Insertion of a plug into the jack automatically silences the internal speaker.
Note: If the audio output is too high when using earphone, use a 200 Ohm resistor in series with one of the earphone leads.

Hailer Speaker Jack. This jack is used for connection of an 8 ohm speaker for hailer operation. The recommnded plug is identical to that described for the External Speaker Jack. The speaker should be capable of handling more than 5 watts of power. The placement of the hailer speaker must always be away from the microphone to prevent acoustical feedback.

Transmitter Operation. Before operating the transmitter the following must be done.
1 A valid Class D citizens band equipment license shall be posted at the main control (fixed) station location.
2 Rules Part 95 must be obtained, read and understood.
To transmit, depress the push-to-talk button on the microphone. Hold the microphone 4 to 6 inches from the mouth and slightly to one side so that the voice does not project directly into the microphone (this provides best results). Speak at a normal level – Never raise your voice or shout into the microphone. During periods of transmission, the receiver is silenced and reception is therefore impossible. In the same way, your signal cannot be heard by another station when he is transmitting – each must take turns. To receive again, simply release the microphone push-to-talk button.
Note: When using the unit as a normal CB transceiver, make sure to place the CB/Hailer/WX switch in the CB position.
Hailer Operation. Special provision has been made for the power hailer operation utilizing the microphone and audio stage of the transceiver. For hailer operation, you should use an external speaker of 8 to 16 Ohm plugged into the Hailer speaker jack on the rear of the unit. Then proceed as follows.
1 Set the Hailer/CB/WX switch (7) to Hailer.
2 Depress the transmit switch atthe side of the microphone. Speak as in transmitting. Adjust the PA loudness with the Volume control (2).
3 Reset the Hailer/CB/WX switch to CB for normal transceiver use of the unit.

Weather Reception

The United States Weather Bureau broadcasts official weather conditions from certain locations on various frequencies. This transceiver is capable of receiving these transmissions, including the Canadian weather broadcast service (CA-1). Consult your local Weather Bureau office for further information concerning these services. To receive weather broadcasts proceed as follows.
1 Set the Hailer/CB/WX switch (7) to WX.
2 Select the weather frequency in your particular area by the weather channel switch (6).
3 Adjust the volume control (2) as desired.
4 When completed reset the Hailer/CB/WX switch mode as desired.

Channel	Channel Frequency in MHz	Channel	Channel Frequency in MHz
1	26.965	21	27.215
2	26.975	22	27.225
3	26.985	23	27.255
4	27.005	24	27.235
5	27.015	25	27.245
6	27.025	26	27.265
7	27.035	27	27.275
8	27.055	28	27.285
9	27.065	29	27.295
10	27.075	30	27.305
11	27.085	31	27.315
12	27.105	32	27.325
13	27.115	33	27.335
14	27.125	34	27.345
15	27.135	35	27.355
16	27.155	36	27.365
17	27.165	37	27.375
18	27.175	38	27.385
19	27.185	39	27.395
20	27.205	40	27.405

Weather Broadcast Frequencies

US-1	162.550	US-3	162.475
US-2	162.400	CA-1	161.650

Servicing the CTX 40-4

Any unit requiring service should be returned to the dealer from which it was purchased or to any service organization qualified to make repairs or internal adjustments to the complex circuits in the unit. It should be noted that under the terms of the warranty, units which show evidence of having been serviced by unauthorized personnel will be ineligible for free service.

Service and alignment.
As an aid to the service technician, this manual contains a schematic diagram, and PC board diagrams in addition to a part list. Also included are instructions for aligning the receiver and transmitter sections.

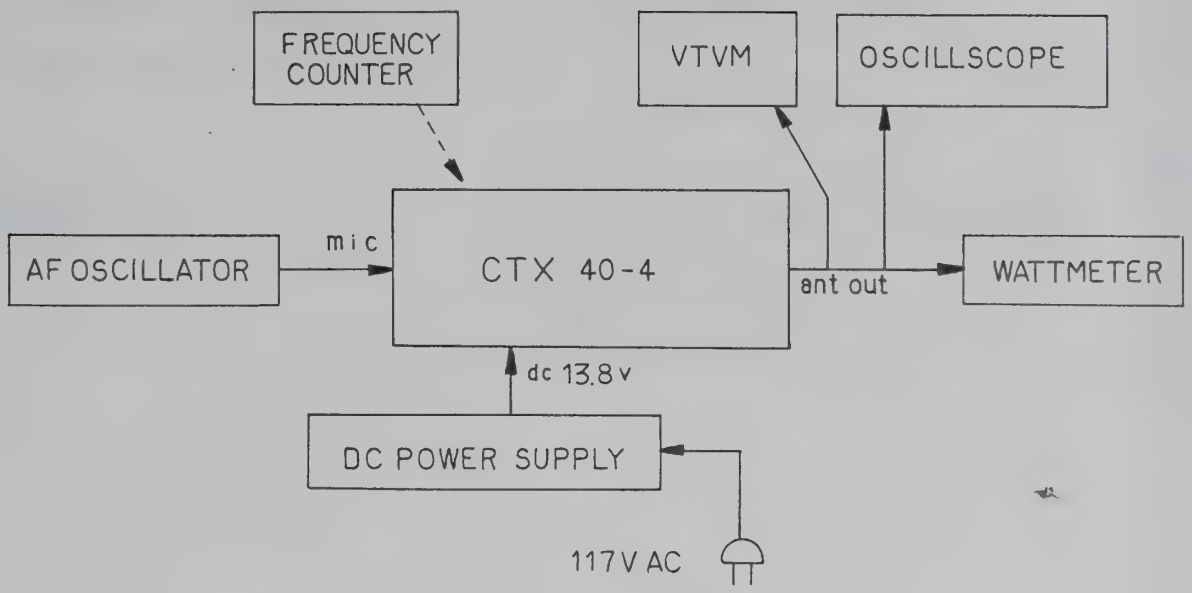
Warning.
As prescribed in Part 95.58 paragraph [e] of the FCC rules and regulations, the manufacturer of this transceiver is required to issue the following warnings:
(1) Certain repairs and adjustments to this transceiver may be made legally by a person in possession of a valid First or Second Class FCC Radiotelephone Operators License (or equivalent in Canada), or by a person under the direct supervision of a holder of such a license. This applies particularly to those repairs of adjustments, such as replacement of crystals and transmitter oscillator components, which might affect the transmitter's ability to comply within FCC regulations.
(2) Use only Cybernet approved replacement parts when servicing the transmitter. The use of a component [such as a crystal, semiconductor, capacitor, etc.] having different electrical characteristics and ratings than that originally used could result in a violation of the FCC regulations and is therefore prohibited.

Alignment Instructions

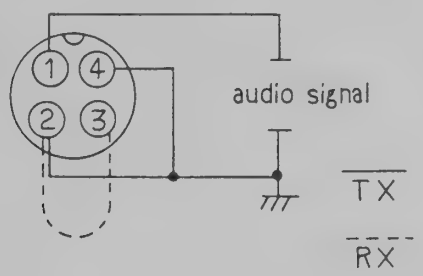
The CTX 40-4has been fully aligned at the factory before shipment to you and does not normally require further adjustment. When necessary, however, the receiver and transmitter may be aligned as indicated.
(1) **Test voltage:** DC 13.8V ± 5%, unless otherwise specified.
(2) **Test equipment:** All test equipment should be properly calibrated.
Audio signal generator, 10 – 20,000 Hz.
Audio level meter, 1 mV measurable.
DC current meter, 5A.
Regulated power supply, DC 0 – 20V, 5A.
Frequency counter, 0 – 40 MHz, high input impedance.
RF VTVM, probe type.
Oscilloscope, high input impedance.
RF Wattmeter, thermo-coupled, 50 Ohm, 15W.
Standard signal generator, 100 kHz – 50 MHz, –10 – +100 dB, 50 Ohm-unbalanced.
Speaker dummy resistor, 8 Ohm, 5W.
Circuit tester, high input impedance, 20 kOhm/V or higher.
FM standard signal generator, set to U.S. weather (NOAA) and Canadian weather broadcast frequencies.

Transmitter Alignment

Connect test equipment as shown below:



To set the unit to transmitting condition, use plug wired as shown and insert it into the microphone jack. This jack may also be used to introduce the test audio to the microphone circuit.



PLL reference frequency (10.24 MHz)
(1) Connect frequency counter to Q-8 emitter.
(2) Check the counter reads 10.24000 MHz.
Tolerance acceptable is ±**250 Hz**.

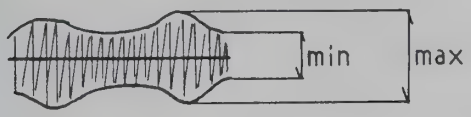
VCO circuit adjustment
(1) Set unit to receiving condition – remove dummy plug from microphone jack.
(2) Select channel 40 (27.405 MHz).
(3) Connect tester (+) to TP-1.
(4) Temporarily rotate T-1 core counterclockwise to fully top position.
(5) Screw in T-1 core slowly for **3.6V** ± 0.2V on tester.
(6) Select channel 1 (26.965 MHz).
(7) Check tester reads 1.5 – 2.2V.
(8) Reset unit to transmit mode – plug in the dummy plug to microphone jack.
(9) Select channel 40.
(10) Adjust CT-1 to 3.6V ± 0.2V.
(11) Select channel 1.
(12) Now tester should read 1.5 – 2.2V.
(13) Recheck steps (5) and (7) in receive mode – if necessary.

RF driver stage adjustment
(1) Reduce power supply voltage to **9.0V**.
(2) Select channel 19 (27.185 MHz).
(3) Connect scope to antenna output.
(4) Apply 1,000 Hz 20 mV audio to microphone input.
(5) Adjust T-2, T-3, and T-4 for maximum scope display.

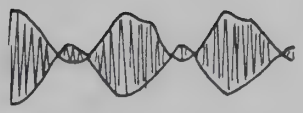
RF power amplifier adkustment
(1) Reset power supply voltage to 13.8V.
(2) Adjust L-7 to 3.8W RF power output.
(3) Check total current is less than 900 mA.
(4) RF power tolerance over all 40 channels should be less than 0.3W.

Transmit frequency check
(1) Set unit to no modulation condition.
(2) Refer to 'PLL Frequency Divisor'.
Check frequency on all channels.
Tolerance within ± 800 Hz is acceptable.

Modulation adjustment
(1) Apply 20 mV 1,000 Hz audio to microphone input circuit.
(2) Adjust RV-2 to 90% modulation.
(3) Apply 2 mV 1,000 Hz audio to microphone input circuit.
(4) Check modulation ratio is more than 50%.



Modulation ratio $= \frac{\text{max}-\text{min}}{\text{max}+\text{min}} \times 100\ (\%)$

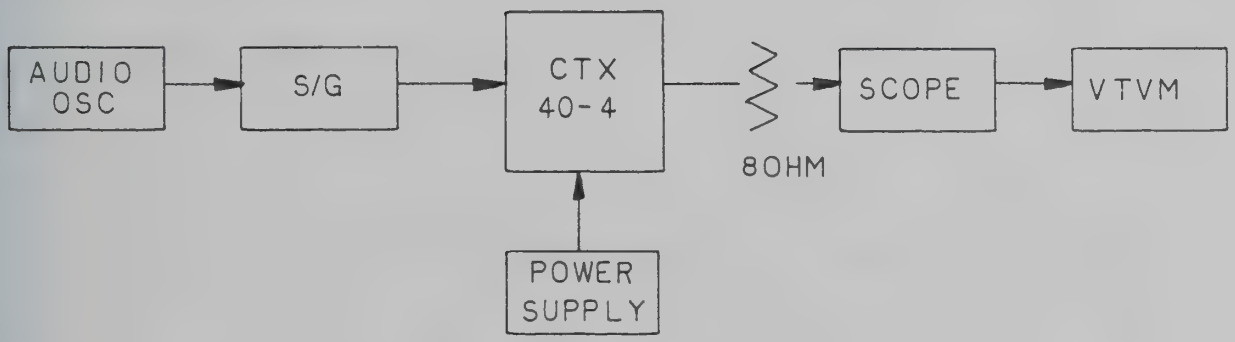


Overmodulation

The RF output at 100% modulation should be greater than that of at no modulation condition by 1.7 times.
(5) Apply 1,000 Hz audio, adjusting the audio level so as to cause 100% modulation.
(6) Change power supply from 10.0 to 16.0V successively, checking for no parastic oscillation or frequency drift being observed.

Receiver Alignment

Connect test equipment as shown:



The receiver audio output will not be heard from the built-in speaker or external speaker outlet unless the microphone plug is inserted to the microphone jack. To introduce the receiver output to the external speaker jack, use the dummy plug wired as shown previously (dot-line).

Sensitivity adjustment
(1) Apply 27.185 MHz generator output modulated 30% with 1,000 Hz audio.
(2) Set unit to channel 19.
(3) Adjust T-5, T-6, T-7, T-8, T-9, and T-10 for maximum audio output.
(4) Check sensitivity on all 40 channels for 2V audio output at 8 Ohm with 10 dB S/N and 1 micro-Volt antenna input.

Squelch adjustment
(1) Apply 50 dB generator output (same modulation condition as above).
(2) Rotate VR-2 (Squelch) clockwise fully.
(3) Adjust RV-1 so that audio output decreases by 6 dB.

FM Weather Monitor Receiver Alignment

Use receiver alignment test set-up replacing S/G (signal-generator) to an FM VHF signal generator. Connect the microphone dummy plug used in the receiver alignment.

Local oscillator/tripler adjustment

(1) Connect frequency counter to TP-6.
(2) Turn unit on. Set mode selector to WX.
(3) Choose US-1 (162.55 MHz).
(4) Adjust CT-2 to 50.618331 MHz. Tolerance within ±100 Hz is acceptable.
(5) Choose US-2 (162.400 MHz).
(6) Adjust CT-3 to 50.568333 MHz. Acceptable tolerance same as (4).
(7) Choose US-3 (162.475 MHz).
(8) Adjust CT-4 to 50.593332 MHz. Acceptable tolerance same as (4).
(9) Choose CA-1 (161.650 MHz).
(10) Adjust CT-5 to 50.318331 MHz. Acceptable tolerance same as (4).
(11) Connect tester plus to TP-4 (Q-21 emitter).
(12) Adjust T-17 and T-18 to maximum.

FM demodulator adjustment

(1) Apply 162.400 MHz FM signal modulated to 3 kHz deviation by 1 kHz audio, level = 40 dB.
(2) Choose US-2.
(3) Adjust T-12 to maximum audio output.

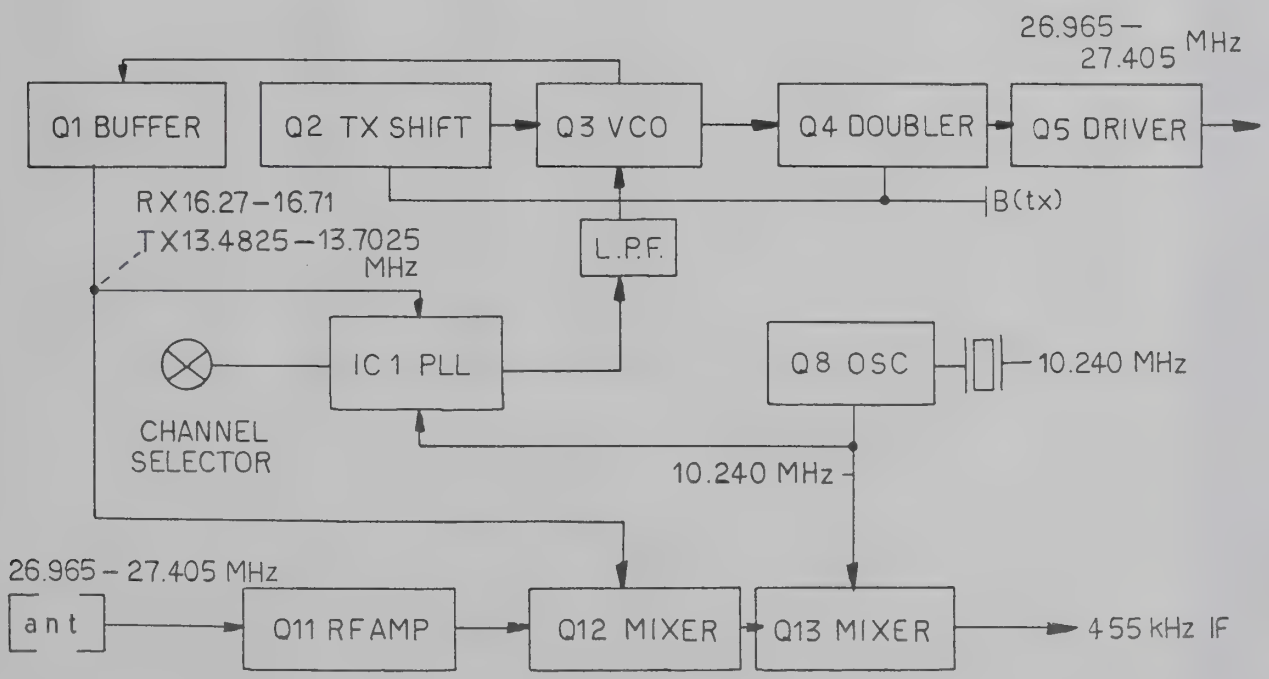
RF amplifier/mixer adjustment

(1) Apply 162.400 MHz signal, no modulation, level = 0.5 to 1.0 micro-V.
(2) Connect tester to TP-5 (D-15 cathode).
(3) Adjust T-14, T-15, and T-16 to **minimum** AGC.
(4) Adjust T-11 to **maximum** AGC.
(5) Adjust generator output to 0.5 micro-V.
(6) Adjust T-13 to minimum audio (noise) level.

Reference: FM weather monitor channel frequency chart.

Channel	Crystal #	RX frequency	Local oscillator frequency
US-1	X-2	162.550 MHz	16.872777 MHz
US-2	X-3	162.400 MHz	16.856111 MHz
US-3	X-4	162.475 MHz	16.864444 MHz
CA-1	X-5	161.650 MHz	16.772777 MHz

Frequency distribution chart



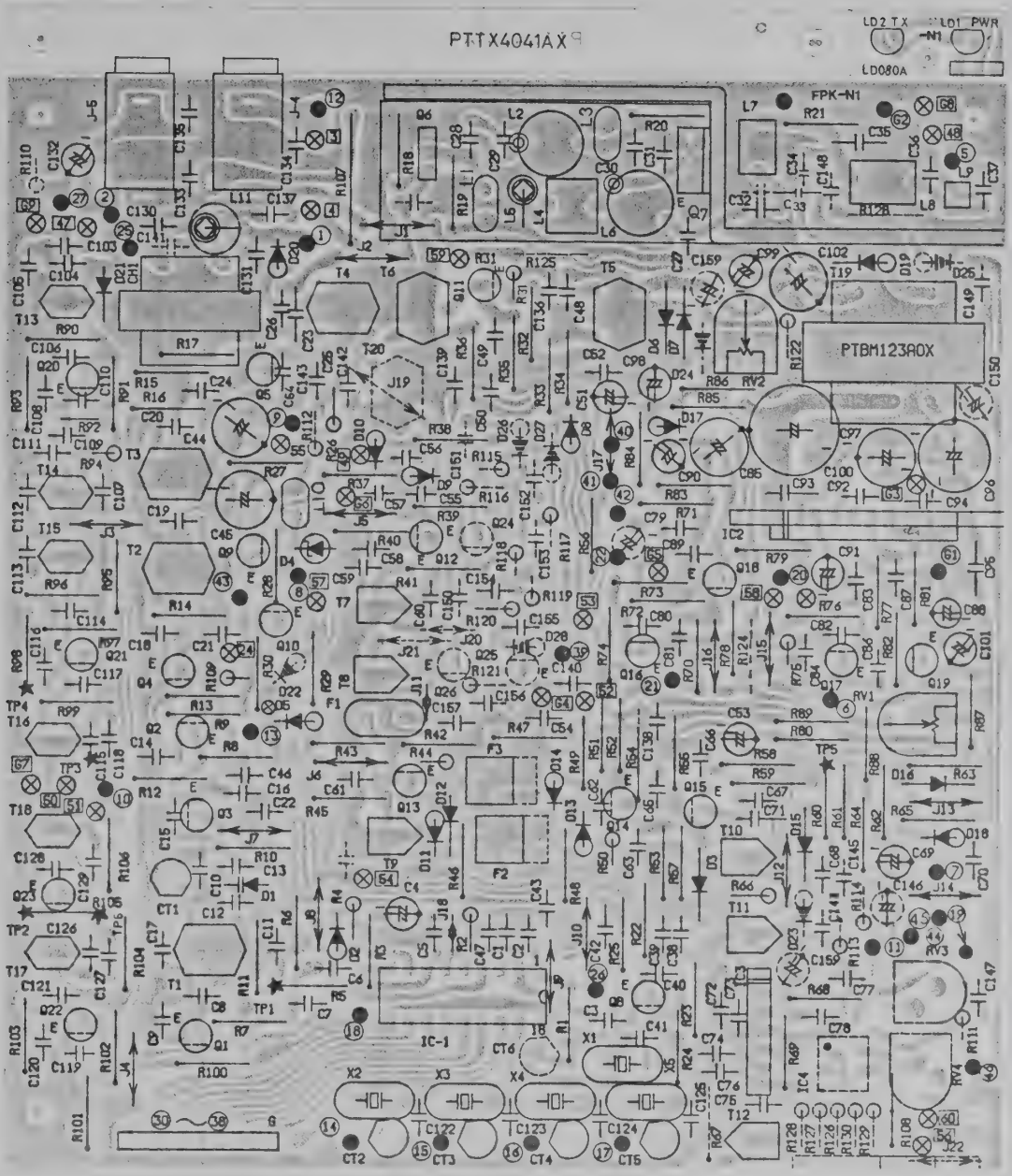
PLL frequency divisor

CH No.	CH Freq. (MHz)	R/T = H (RX)		R/T = L (TX)		Programming code/PIN No.							
		N	f_{VCO} (MHz)	N	f_{VCO} (MHz)	10 P_0	11 P_1	12 P_2	13 P_3	14 P_4	15 P_5	16 P_6	17 P_7
1	26.965	3254	16.270	5393	13.4825	○	○	○	○	○	○	○	○
2	26.975	3256	16.280	5395	13.4875	○					○	○	○
3	26.985	3258	16.290	5397	13.4925	○			○		○	○	○
4	27.005	3262	16.310	5401	13.5025		○		○	○	○	○	○
5	27.015	3264	16.320	5403	13.5075				○		○	○	○
6	27.025	3266	16.330	5405	13.5125		○				○	○	○
7	27.035	3268	16.340	5407	13.5175	○		○	○	○	○	○	○
8	27.055	3272	16.360	5411	13.5275						○	○	○
9	27.065	3274	16.370	5413	13.5325				○	○	○	○	○
10	27.075	3276	16.380	5415	13.5375			○				○	○
11	27.085	3278	16.390	5417	13.5425	○	○	○	○	○		○	○
12	27.105	3282	16.410	5421	13.5525	○						○	○
13	27.115	3284	16.420	5423	13.5575	○			○			○	○
14	27.125	3286	16.430	5425	13.5625		○		○	○		○	○
15	27.135	3288	16.440	5427	13.5675				○			○	○
16	27.155	3292	16.460	5431	13.5775		○					○	○
17	27.165	3294	16.470	5433	13.5825	○		○	○	○		○	○
18	27.175	3296	16.480	5435	13.5875							○	○
19	27.185	3298	16.490	5437	13.5925				○	○		○	○
20	27.205	3302	16.510	5441	13.6025			○			○		○
21	27.215	3304	16.520	5443	13.6075	○	○	○	○	○	○		○
22	27.225	3306	16.530	5445	13.6125	○					○		○
23	27.255	3312	16.560	5451	13.6275	○			○		○		○
24	27.235	3308	16.540	5447	13.6175		○		○	○	○		○
25	27.245	3310	16.550	5449	13.6225				○		○		○
26	27.265	3314	16.570	5453	13.6325		○				○		○
27	27.275	3316	16.580	5455	13.6375	○		○	○	○	○		○
28	27.285	3318	16.590	5457	13.6425						○		○
29	27.295	3320	16.600	5459	13.6475				○	○	○		○
30	27.305	3322	16.610	5461	13.6525			○					○
31	27.315	3324	16.620	5463	13.6575	○	○	○	○	○			○
32	27.325	3326	16.630	5465	13.6625	○							○
33	27.335	3328	16.640	5467	13.6675	○			○				○
34	27.345	3330	16.650	5469	13.6725		○		○	○			○
35	27.355	3332	16.660	5471	13.6775				○				○
36	27.365	3334	16.670	5473	13.6825		○						○
37	27.375	3336	16.680	5475	13.6875	○		○	○	○			○
38	27.385	3338	16.690	5477	13.6925								○
39	27.395	3340	16.700	5479	13.6975				○	○			○
40	27.405	3342	16.710	5481	13.7025			○				○	

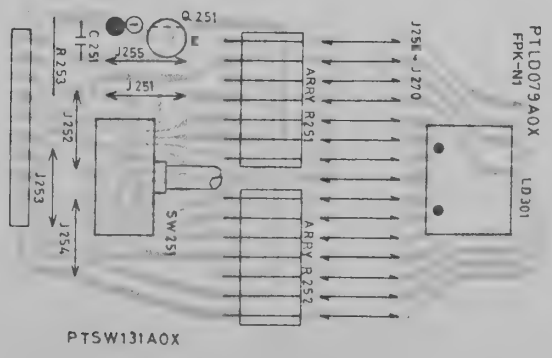
○ = On (H)

f_{VCO} = 0.005 x N (MHz)

PTBM123



PTLD079
PTSW131



	PART NAME	PART CODE	
	ELEC. ELEMENTS	CMAY6AACAL1	

ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC	QTY USED
1	EXPLODED	APTTX4041I		P.W.BOARD ASSY			1
2	EXPLODED	APTTX4042I		P.W.BOARD ASSY			1
3		CKDB103PEM		CERAMIC CAP.	0.01MFD 50V -0, +100% E	C203	1
4		CKDB222PEM		CERAMIC CAP.	2200PF 50V -0, +100% E	C201	1
5		CKDB472PEM		CERAMIC CAP.	4700PF 50V -0, +100% E	C202	1
6		GTX40+4402		WIRES KIT			1
7		RVNA103P23		VR.		VR2	1
8		RVNB503A21		VR.		VR1/S1	1
9		SRD204111H		ROTARY SWITCH		S2	1
10		SRD402104H		ROTARY SWITCH		S1	1
11		WP03060DBC		PC-JOINT			1
12		WP10060DBC		PC JOINT			1
13		WYG412BDAA		STRANDED WIRE		AC1	1
14		WYG512BDAA		STRANDED WIRE		AC2	1
15		YJB02S01U		DC JACK		J3	1
16		YJC02S015Z		ANT JAK		J2	1
17		YJZ04S0027		JACK		J1	1
18		ZQA0770807		SPEAKER		SP	1
19		ZZZ0000036		F-BRAID WIRE.			2
20		ZZZ0DC0149		F-BRAID WIRE			1
21							

	PART NAME	PART CODE	
	P.W.BOARD ASSY	APTRM1234G	

ITEM	REMARKS	PART CODE	STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				Q'TY USED
1		CCFB120KDM		CERAMIC CAP.	12PF 50V -10, +10% SL	C7				1
2		CCFB121KDM		CERAMIC CAP.	120PF 50V -10, +10% SL	C17	C23	C32		3
3		CCFB150KDM		CERAMIC CAP.	15PF 50V -10, +10% SL	C19				1
4		CCFB151KDM		CERAMIC CAP.	150PF 50V -10, +10% SL	C28	C36	C39		3
5		CCFB220KDM		CERAMIC CAP.	22PF 50V -10, +10% SL	C13	C31	C9		3
6		CCFB221KDM		CERAMIC CAP.	220PF 50V -10, +10% SL	C29	C94			2
7		CCFB270KDM		CERAMIC CAP.	27PF 50V -10, +10% SL	C34	C8			2
8		CCFB330KPM		CERAMIC CAP.	33PF 50V -10, +10% PH	C105	C41			2
9		CCFB330KDM		CERAMIC CAP.	33PF 50V -10, +10% SL	C103	C37	C6		3
10		CCFB331KDM		CERAMIC CAP.	330PF 50V -10, +10% SL	C74				1
11		CCFB391KDM		CERAMIC CAP.	390PF 50V -10, +10% SL	C35				1
12		CCFB680KPM		CERAMIC CAP.	68PF 50V -10, +10% PM	C127				1
13		CCFB820KPM		CERAMIC CAP.	82PF 50V -10, +10% PH	C120				1
14		CCFB820KDM		CERAMIC CAP.	82PF 50V -10, +10% SL	C20				1
15		CEAB330ALX		ELYT. CAPACITOR	33MFD 6.3V	C101	C90			2
16		CEAC221ACX		ELYT. CAPACITOR	220MFD 10V S-SERIES	C45				1
17		CEAD101ACX		ELYT. CAPACITOR	100MFD 16V S-SERIES	C44				1
18		CEAD101ALX		ELYT. CAPACITOR	100MFD 16V	C85				1
19		CEAD221ZLS		ELYT. CAPACITOR	220MFD 16V SP	C96				1
20		CEAD470ALX		ELYT. CAPACITOR	47MFD 16V	C132	C97			2
21		CEAF3R3ALX		ELYT. CAPACITOR	3.3MFD 25V	C99				1

	PART NAME	PART CODE	
	P.W.BOARD ASSY	SPT9M1231G	

ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				QTY USED
1		BSPB3006N4		BIND HEAD SCREW	(+)BIT, M3 X 6 S-NI					3
2		BSPU3006NM		THIN BIND SCREW	(+)BIT, M3 X 6 S-NI					1
3		CCDB0R5CC4		CERAMIC CAP.	CK 0.5PF 50V -0.25, +0.25PF	C112				1
4		CCDB04DCP4		CERAMIC CAP.	PH 4PF 50V -0.25, +0.25PF	C57				1
5		CCDB05DDJ4		CERAMIC CAP.	SL 5PF 50V -0.5, +0.5PF	C71				1
6		CCDB08DPJ4		CERAMIC CAP.	PH 8PF 50V -0.5, +0.5PF	C104	C109			2
7		CCDB10DDJM		CERAMIC CAP.	SL 10PF 50V -0.5, +0.5PF	C42				1
8		CCDB121KBM		CERAMIC CAP.	120PF 50V -10, +10% SL		C16	C23		3
9		CCDB150KP4		CERAMIC CAP.	15PF 50V -10, +10% PH	C10				1
10		CCDB221KBM		CERAMIC CAP.	220PF 50V -10, +10% SL	C92				1
11		CCDB271KCU		CERAMIC CAP.	270PF 50V -10, +10% CH	C33				1
12		CCDB331KBM		CERAMIC CAP.	330PF 50V -10, +10% SL	C75				1
13		CCDB360KP4		CERAMIC CAP.	36PF 50V -10, +10% PH	C122	C123	C124	C125	4
14		CCDB470KBM		CERAMIC CAP.	47PF 50V -10, +10% SL	C136	C3			2
15		CCDB680KPM		CERAMIC CAP.	68PF 50V -10, +10% PH	C126				1
16		CCDB820KPM		CERAMIC CAP.	82PF 50V -10, +10% PH	C12				1
17		CCDB820KBM		CERAMIC CAP.	82PF 50V -10, +10% SL	C141				1
18		CCFB010CC4		CERAMIC CAP.	SL 1PF 50V -0.25, +0.25PF	C115				1
19		CCFB020CCM		CERAMIC CAP.	SL 2PF 50V -0.25, +0.25PF	C60				1
20		CCFB080DPM		CERAMIC CAP.	PH 8PF 50V -0.5, +0.5PF	C113	C128			2
21		CCFB101KBM		CERAMIC CAP.	100PF 50V -10, +10% SL	C30				1

EXPLODED ASSEMBLY	PART NAME	PART CODE	
	P.W.BOARD ASSY	APTBM1234G	

ITEM	REMARKS	PART CODE	STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				QTY USED
1		CEAF4R7ALX		ELYT. CAPACITOR	4.7MFD 25V	C51				1
2		CEAE470ZLS		ELYT. CAPACITOR	47MFD 25V SP	C102				1
3		CEAG010ALX		ELYT. CAPACITOR	1MFD 50V	C69				1
4		CEAG010ZMN		ELYT. CAPACITOR	1MFD 50V MS	C4				1
5		CEED102ALX		ELYT. CAPACITOR	1000MFD 16V	C100				1
6		CEVB330ALX		ELYT. CAPACITOR		C91				1
7		CEVD100ALX		ELYT. CAPACITOR		C53				1
8		CEVE3R3ALX		ELYT. CAPACITOR		C98				1
9		CKDB102PEM		CERAMIC CAP.	1000PF 50V -0, +100% E	C55	C56			2
10		CKDB103PEM		CERAMIC CAP.	0.01MFD 50V -0, +100% E	C1	C107	C108	C110	24
11						C116	C118	C130	C131	
12						C138	C139	C140	C18	
13						C21	C25	C38	C43	
14						C46	C50	C54	C58	
15						C64	C73	C80	C89	
16		CKDB222PEM		CERAMIC CAP.	2200PF 50V -0, +100% E	C134				1
17		CKDB391KBM		CERAMIC CAP.	390PF 50V -10, +10% B	C26				1
18		CKDB472PEM		CERAMIC CAP.	4700PF 50V -0, +100% E	C137				1
19		CKFB102PEM		CERAMIC CAP.	1000PF 50V -0, +100% E	C84				1
20		CKFB103PEM		CERAMIC CAP.	0.01MFD 50V -0, +100% E	C106	C111	C114	C117	18
21						C121	C129	C14	C2	

	PART NAME	PART CODE	
	P.W.BOARD ASSY	APT3M123AG	

ITEM	REMARKS	PART CODE	STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				Q'TY USED
1						C22	C24	C27	C47	
2						C48	C49	C5	C52	
3						C59	C61			
4		CKEB221KBM		CERAMIC CAP.		C119	C15			2
5		CKEB331KBM		CERAMIC CAP.	330PF 50V -10, +10% B	C40				1
6		CKEB472PBM		CERAMIC CAP.	470CPF 50V -0, +100% E	C133	C135	C83	C87	4
7		CKEB473ZFM		CERAMIC CAP.	0.047MFD 50V -20, +80% F	C67				1
8		CKEB561KBM		CERAMIC CAP.	560PF 50V -10, +10% B	C82				1
9		CQMB102KTH		MYLAR CAPACITOR	1000PF 50V -10, +10%	C62				1
10		CQMB103KBH		MYLAR CAPACITOR	0.01MFD 50V -10, +10%	C65	C76			2
11		CQMB103KTH		MYLAR CAPACITOR	0.01MFD 50V -10, +10%	C86				1
12		CQMP183KTH		MYLAR CAPACITOR		C68				1
13		CQMB223KTH		MYLAR CAPACITOR	0.022MFD 50V -10, +10%	C11	C72	C78		3
14		CQMB223KTH		MYLAR CAPACITOR	0.022MFD 50V -10, +10%	C77	C81			2
15		CQMB472KTH		MYLAR CAPACITOR	4700PF 50V -10, +10%	C70				1
16		CQMB473KBH		MYLAR CAPACITOR	0.047MFD 50V -10, +10%	C79				1
17		CQMB473KTH		MYLAR CAPACITOR	0.047MFD 50V -10, +10%	C63	C66			2
18		CQMB683KTH		MYLAR CAPACITOR	0.068MFD 50V -10, +10%	C93	C95			2
19		CSSE3R3MFC		TANTALUM CAP.	3.3MFD 25V -20, +20%	C88				1
20		CTZ62C0H01		TRIMMER CAP.		CT1	CT2	CT3	CT4	5
21						CT5				

	PART NAME	PART CODE	
	P.W.BOARD ASSY	APTBM123AG	

ITEM	REMARKS	PART CODE	STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC	QTY USED
1		FBP455A21P		CERAMIC FILTER		CF2	1
2		FBR455F07M		CERAMIC FILTER		CF3	1
3		FB10R7A01M		CERAMIC FILTOR		CF1	1
4		LA1DG1103A		RF COIL		L9	1
5		LA1JF1009A		RF COIL		L7	1
6		LA1JG1012A		CHOKE COIL		L8	1
7		LA1KE1011A		RF COIL		L4	1
8		LA3MG1005A		RF COIL		L2	1
9		LA3MG1013A		RF COIL		L6	1
10		LDADB4024B		RF COIL		L11	1
11		LDADX3825M		RF COIL		L5	1
12		LF2R2KB02S		RF COIL		L1	1
13		LF680KB01S		RF COIL		L10 L3	2
14		LJ119H001Y		CHOKE COIL		CH1	1
15		ML344AD001		HEAT SINK			1
16		MP263AD001		HEAT SINK			1
17		MS327AD004		HEAT SINK			1
18		MS665SD001		SHIELD			1
19		MU462SD001		SHIELD			1
20		MW201BS001		TERMINAL			25
21		MW401CX002		SHORT JUMPER			1

	PART NAME	PART CODE	STOCK NO.
	P.W.B ASSY	SPTBM123AG	

ITEM	REMARKS	PART CODE	STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				Q'TY USED
1		MW401CX0J4		SHORT JUMPER	J#-5					2
2		MW401CX0C6		SHOT JAMPER	10MM					16
3		PTBM123A0X		P.W.BOARD						1
4		PTTX4041AX		P.W.BOARD						1
5		QDCTT417X0		VARI-CAP. DIODE	1TT410 12V NO-RANK 26MIN	D1				1
6		QDG1K261XP		GERMANIUM DIODE	1K261 35V NO-RANK 26MIN	D15	D17	D18		3
7		QDSMA150XN		SILICON DIODE	MA150 VF=1.2V,VR=35V NO-RANK 24MIN	D10	D11	D12	D13	14
8						D14	D16	D2	D21	
9						D3	D5	D6	D7	
10						D8	D9			
11		QDSSR1KX4P		SILICON DIODE	SR1K-4 VR=200 4-RANK 25MIN	D19	D20			2
12		QDZRD9EXBA		ZENER DIODE	RD9.1E V7=9.12-9.68V B-RANK	D4				1
13		QQMBA403AX		I.C		IC3				1
14		QQM0720S8T		I.C.	TA7205AP5.8W AUDIO-POWER-AMP	IC2				1
15		QQC09[illegible]09AT		I.C.	TC91C9P CH-PLL F-SYNTHESIZER	IC1				1
16		QTA056[illegible]XJN		TRANSISTOR	2SA564 Q,P,S-RANK	Q18				1
17		QTA0719XHN		TRANSISTOR	2SA719 P,G,R-RANK	Q10				1
18		QTC0710XBE		TRANSISTOR	2SC710 B-RANK	Q14				1
19		QTC0710XCE		TRANSISTOR	2SC710 C,D-RANK	Q11				1
20		QTC0710XEE		TRANSISTOR	2SC710 D,E-RANK	Q12	Q5			2
21		QTC0828XCN		TRANSISTOR	2SC828 T-RANK	Q2				1

	PART NAME	PART CODE	
	P.W.BOARD ASSY	APTBM1234AG	

ITEM	REMARKS	PART CODE	STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				Q'TY USED
1		QTC0828XEN		TRANSISTOR	2SC828 C,R-RANK	Q15	Q16			2
2		QTC0945ADA		TRANSISTOR	2SC945A Q,R-RANK	Q19				1
3		QTC1047XBN		TRANSISTOR	2SC1047 B,C-RANK	Q20				1
4		QTC1327XBN		TRANSISTOR	2SC1327 T-RANK	Q17				1
5		QTC1359XBN		TRANSISTOR	2SC1359 B,C-RANK	Q1	Q22	Q3	Q4	4
6		QTC1383XCN		TRANSISTOR	2SC1383 Q,R-RANK	Q9				1
7		QTC1675XBA		TRANSISTOR	2SC1675 K,L-RANK	Q13	Q21	Q23		3
8		QTC1675XEA		TRANSISTOR	2SC1675 M,L-RANK	Q8				1
9		QTC1846XAN		TRANSISTOR	2SC1846 Q,R,S-RANK	Q6				1
10		QTC1974XBN		TRANSISTOR	2SC1974 NO-RANK(NEW PELET)	Q7				1
11		RD18TJ390X		CARBON FILM R.		R92				1
12		RD25PJ100X		CARBON FILM R.	0.25W 10 OHM 5%	R100				1
13		RD25PJ101X		CARBON FILM R.	0.25W 100 OHM 5%	R18	R36			2
14		RD25PJ102X		CARBON FILM R.	0.25W 1K OHM 5%	R103	R22	R45	R84	6
15						R86	R93			
16		RD25PJ103X		CARBON FILM R.	0.25W 10K OHM 5%	R30	R52	R69	R73	6
17						R74	R82			
18		RD25PJ104X		CARBON FILM R.	0.25W 100K OHM 5%	R5				1
19		RD25PJ121X		CARBON FILM R.	0.25W 120 OHM 5%	R68				1
20		RD25PJ153X		CARBON FILM R.	0.25W 15K OHM 5%	R55	R83			2
21		RD25PJ154X		CARBON FILM R.	0.25W 150K OHM 5%	R13	R51	R61	R7	4

	PART NAME	PART CODE	
	P.W.BOARD ASSY	AD1BM123^G	

ITEM	REMARKS	PART CODE	STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				QTY USED
1		RD25PJ182X		CARBON FILM R.	0.25W 1.8K OHM 5%	R87				1
2		RD25PJ183X		CARBON FILM R.	0.25W 18K OHM 5%	R89				1
3		RD25PJ221X		CARBON FILM R.	0.25W 220 OHM 5%	R104	R106	R19	R95	4
4		RD25PJ222X		CARBON FILM R.	0.25W 2.2K OHM 5%	R101	R102	R24	R77	5
5						R79				
6		RD25PJ223X		CARBON FILM R.	0.25W 22K OHM 5%	R11	R60	R88	R91	4
7		RD25PJ224X		CARBON FILM R.	0.25W 220K OHM 5%	R10				1
8		RD25PJ271X		CARBON FILM R.	0.25W 270 OHM 5%	R25	R27			2
9		RD25PJ272X		CARBON FILM R.	0.25W 2.7K OHM 5%	R12	R39	R85		3
10		RD25PJ273X		CARBON FILM R.	0.25W 27K OHM 5%	R70				1
11		RD25PJ331X		CARBON FILM R.	0.25W 330 OHM 5%	R58				1
12		RD25PJ332X		CARBON FILM R.	0.25W 3.3K OHM 5%	R28	R33	R48	R49	7
13						R57	R72	R9		
14		RD25PJ333X		CARBON FILM R.	0.25W 33K OHM 5%	R56	R64	R97		3
15		RD25PJ334X		CARBON FILM R.	0.25W 330K OHM 5%	R105				1
16		RD25PJ391X		CARBON FILM R.	0.25W 390 OHM 5%	R14	R29	R42		3
17		RD25PJ392X		CARBON FILM R.	0.25W 3.9K OHM 5%	R43				1
18		RD25PJ470X		CARBON FILM R.	0.25W 47 OHM 5%	R1	R59	R80		3
19		RD25PJ471X		CARBON FILM R.	0.25W 470 OHM 5%	R40	R41	R53	R76	5
20						R99				
21		RD25PJ472X		CARBON FILM R.	0.25W 4.7K OHM 5%	R15	R23	R37	R38	7

	PART NAME	PART CODE	
	P.W.BOARD ASSY	APTBM1234G	

ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				Q'TY USED
1						R78	R90	R96		
2		RD25PJ473X		CARBON FILM R.	0.25W 47K OHM 5%	R21	R62	R65	R8	4
3		RD25PJ561X		CARBON FILM R.	0.25W 560 OHM 5%	R98				1
4		RD25PJ562X		CARBON FILM R.	0.25W 5.6K OHM 5%	R3	R71			2
5		RD25PJ680X		CARBON FILM R.	0.25W 68 OHM 5%	R17	R20			2
6		RD25PJ681X		CARBON FILM R.	0.25W 680 OHM 5%	R35	R54			2
7		RD25PJ682X		CARBON FILM R.	0.25W 6.8K OHM 5%	R16	R46	R47		3
8		RD25PJ683X		CARBON FILM R.	0.25W 68K OHM 5%	R63				1
9		RD25PJ820X		CARBON FILM R.	0.25W 82 OHM 5%	R81				1
10		RD25PJ821X		CARBON FILM R.	0.25W 820 OHM 5%	R108	R32	R6		3
11		RD25PJ823X		CARBON FILM R.	0.25W 82K OHM 5%	R34				1
12		RD25VJ180X		CARBON FILM R.	0.25W 18 OHM 5%	R31				1
13		RD25VJ181X		CARBON FILM R.	0.25W 180 OHM 5%	R44				1
14		RD25VJ332X		CARBON FILM R.	0.25W 3.3K OHM 5%	R4				1
15		RD25VJ471X		CARBON FILM R.	0.25W 470 OHM 5%	R94				1
16		RD25VJ472X		CARBON FILM R.	0.25W 4.7K OHM 5%	R50				1
17		RD25VJ561X		CARBON FILM R.	0.25W 560 OHM 5%	R2				1
18		RD25VJ821X		CARBON FILM R.	0.25W 820 OHM 5%	R109				1
19		RD25VJ823X		CARBON FILM R.	0.25W 82K OHM 5%	R66				1
20		RD25VJ824X		CARBON FILM R.	0.25W 820K OHM 5%	R75				1
21		RPGNB10301		SEMI-FIXED VR.	10K OHM B-CURVE	RV1				1

	PART NAME	PART CODE	
	P.W.BOARD ASSY	A2TBM1234G	

ITEM	REMARKS	PART CODE	STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				QTY USED
1		RPGNB20201		SEMI-FIXED VR.	2K OHM B-CURVE	RV2				1
2		RXHANJ100B		M-OXIDE FILM R.	1/2W 10 OHM 5%	R26				1
3		RX2ANJ150B		M-OXIDE FILM R.	2W 15 OHM 5%	R107				1
4		TBG25B001W		AF O.P.T.		T19				1
5		TR07FP001M		RF COIL		T13	T15	T18		3
6		TR07FQ001M		RF COIL		T14				1
7		TR07LA004N		I.F.T.		T9				1
8		TR07LA005N		I.F.T.		T11				1
9		TR07LA023N		I.F.T.		T10	T12			2
10		TR07MA002M		RF COIL		T16				1
11		TR07MA006N		RF COIL		T7	T8			2
12		TR07NZ005A		RF COIL		T17				1
13		TR10CA003T		RF COIL		T6				1
14		TR10CB003T		R.F.T.		T2	T3			2
15		TR10CP005S		RF TRANS		T4				1
16		TR10DB003M		RF COIL		T1				1
17		TR10MP003T		RF COIL		T5				1
18		VE164DN003		BUSHING						1
19		VS223RH002		SILICON SHEET						1
20		WD0513EEEE		COAXIAL CABLE		NO1				1
21		WD052JEEEE		COAXIAL CABLE		NO2				1

	PART NAME	CYBERNET PART CODE	
	P.W.BOARD ASSY	A0TBM123AG	

ITEM	REMARKS	PART CODE	STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				Q'TY USED
1		WTG110EEXX		SOLID WIRE		N03				1
2		WTG715EEXX		SOLID WIRE		N04				1
3		WTG824EEXX		SOLID WIRE		N05				1
4		XAR1A1WXCT		XTAL OSCILLATOR		X5				1
5		XAR1A1WX1T		XTAL OSCILLATOR		X2				1
6		XAR1A1WX2T		XTAL OSCILLATOR		X3				1
7		XAR1A1WX3T		XTAL OSCILLATOR		X4				1
8		XAS1C2C01T		XTAL OSCILLATOR	HC-43/U 10.240MHZ	X1				1
9		YJT03S022Z		BP JACK		J4	J5			2
10										

	PART NAME	PART CODE	
	P.W.BOARD ASSY	A0TLD079AA	

ITEM	REMARKS	CYBERNET PART CODE	CUSTOMER'S PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				Q'TY USED
1		PTLD079[illegible]X		P.W.BOARD						1
2		CL SL127[illegible]		L.E.DIODE		LD3D1				1
15										

	PART NAME	PART CODE	
	P.W.BOARD ASSY	A0TLD080AA	

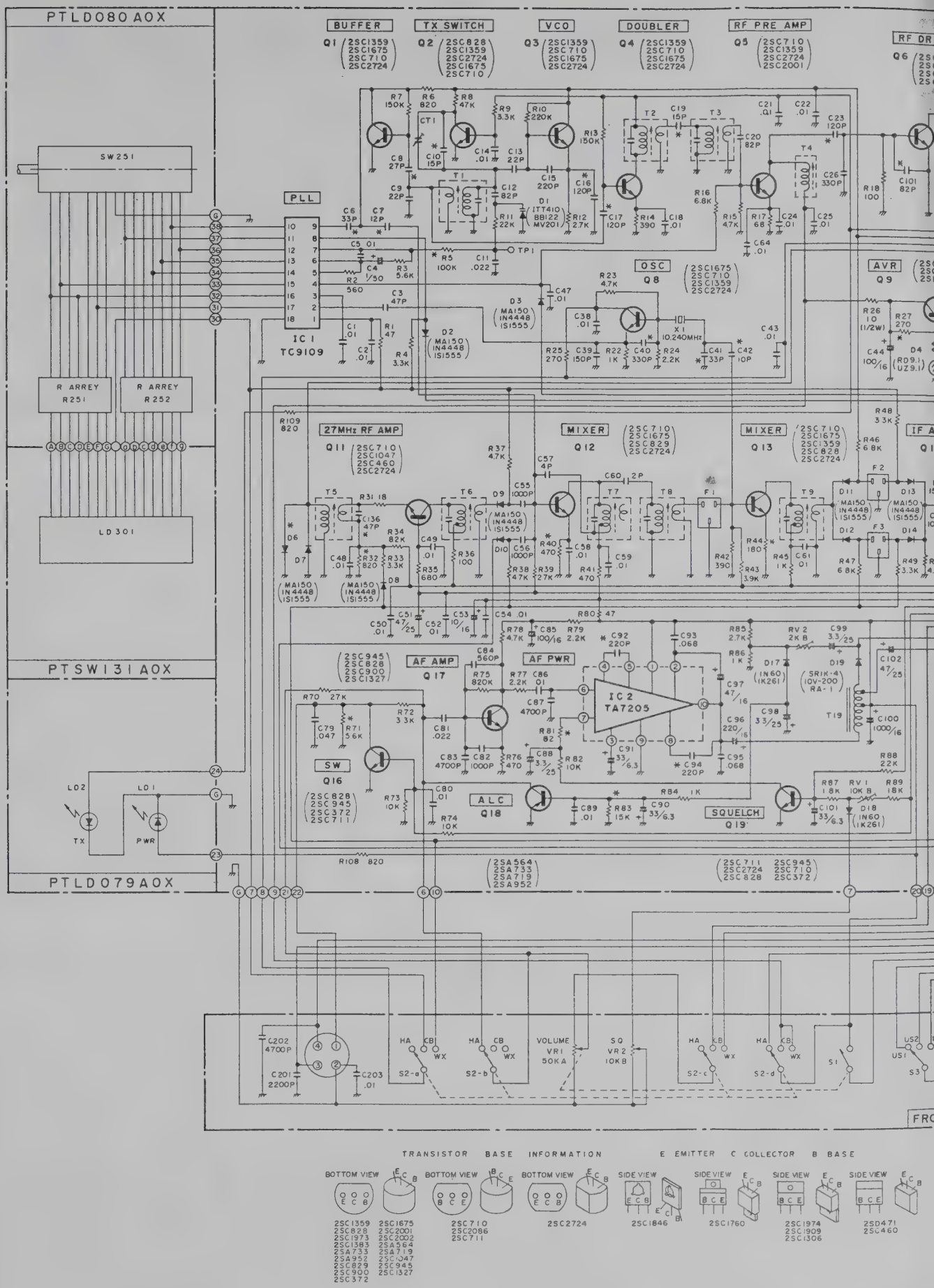
ITEM	REMARKS	PART CODE	CUSTOMER'S PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				Q'TY USED
1		PTLD080[illegible]X		P.W.BOARD						1
2		DLA1N28RPN		L.E.D.	LN28RP RED 2.1V	LD1				1
3		DLA1N38GPA		L.E.D.	LN38GP GREEN 2.1V	LD2				1
21										

	PART NAME	PART CODE	
	P.W.BOARD ASSY	APTSW131AA	

ITEM	REMARKS	PART CODE	STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC				Q'TY USED
1		MW401CX006		SHOT JAMPER	10MM					20
2		PTSW131A0X		P.W.BOARD						1
3		PTTX4042AX		P.W.BOARD						1
4		RAC102M07N		RESISTOR ARRAY		R251	R252			2
5		SR1340202H		ROTARY SWITCH		SW251				1
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										

	PART NAME	PART CODE	
	P.W.BOARD ASSY	APTSW131AA	

ITEM	REMARKS	PART CODE	STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC	QTY USED
1		AMTX40+401		ESCUTCHEON ASSY			
2		MU331SN001		CHASSIS			
3		MU761SZ001		SPEAKER CHASSIS			
4		VB776SX001		CABINET CASING			
5		VN276SP034		KNOB, ROTARY CONT			
6		VN286SP029		KNOB, CHANNEL SEL			
7		KTTX40+4XX		OWNER'S MANUAL			
8		KW000037DX		FCC PART 95 BOOK			
9		KZ000017EX		FCC FORM 505			
10		KZ000024AX		FCC FORM 555-B			
11		KKTX40+401		CARTON			
12		ACDC036GEA		DC POWER CABLE			
13		MU676SM001		MOUNTING BRACKET			
14		VS655RW001		MOUNTING BRACKET PROTECTIVE PAD			
15		ZGAAZ501G0		MICROPHONE			
16							
17							
18							
19							
20							
21							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PTSW131AOX
PTLD079AOX
BUFFER
Q1 (2SC1359 2SC1675 2SC710 2SC2724)
TX SWITCH
Q2 (2SC828 2SC1359 2SC2724 2SC1675 2SC710)
VCO
Q3 (2SC1359 2SC710 2SC1675 2SC2724)
DOUBLER
Q4 (2SC1359 2SC710 2SC1675 2SC2724)
RF PRE AMP
Q5 (2SC710 2SC1359 2SC2724 2SC2001)
RF DR
Q6
SW251
PLL
IC1
TC9109
R ARREY R251
R ARREY R252
LD301
OSC
Q8 (2SC1675 2SC710 2SC1359 2SC2724)
AVR
Q9
27MHz RF AMP
Q11 (2SC710 2SC1047 2SC460 2SC2724)
MIXER
Q12 (2SC710 2SC1675 2SC829 2SC2724)
MIXER
Q13 (2SC710 2SC1675 2SC1359 2SC828 2SC2724)
IF A
AF AMP
Q17 (2SC945 2SC828 2SC900 2SC1327)
AF PWR
IC2
TA7205
SW
Q16 (2SC828 2SC945 2SC372 2SC711)
ALC
Q18
SQUELCH
Q19
LD2
LD1
TX
PWR
VOLUME VR1 50KA
SQ VR2 10KB
S2-a
S2-b
S2-c
S2-d
S1
S3
TRANSISTOR BASE INFORMATION
E EMITTER C COLLECTOR B BASE
BOTTOM VIEW
SIDE VIEW
2SC1359 2SC828 2SC1973 2SC1383 2SA733 2SA952 2SC829 2SC900 2SC372
2SC1675 2SC2001 2SC2002 2SA564 2SA719 2SC1047 2SC945 2SC1327
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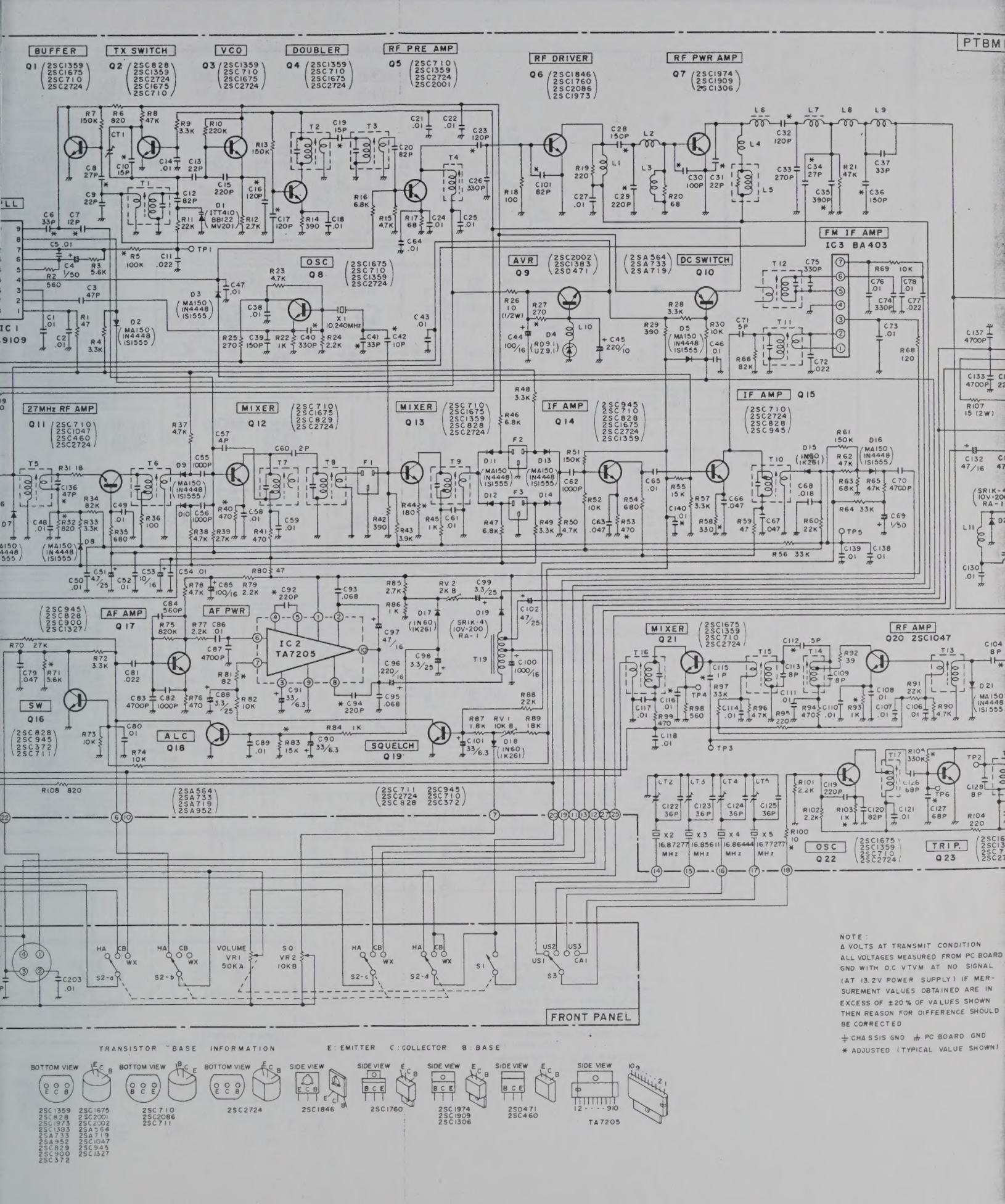
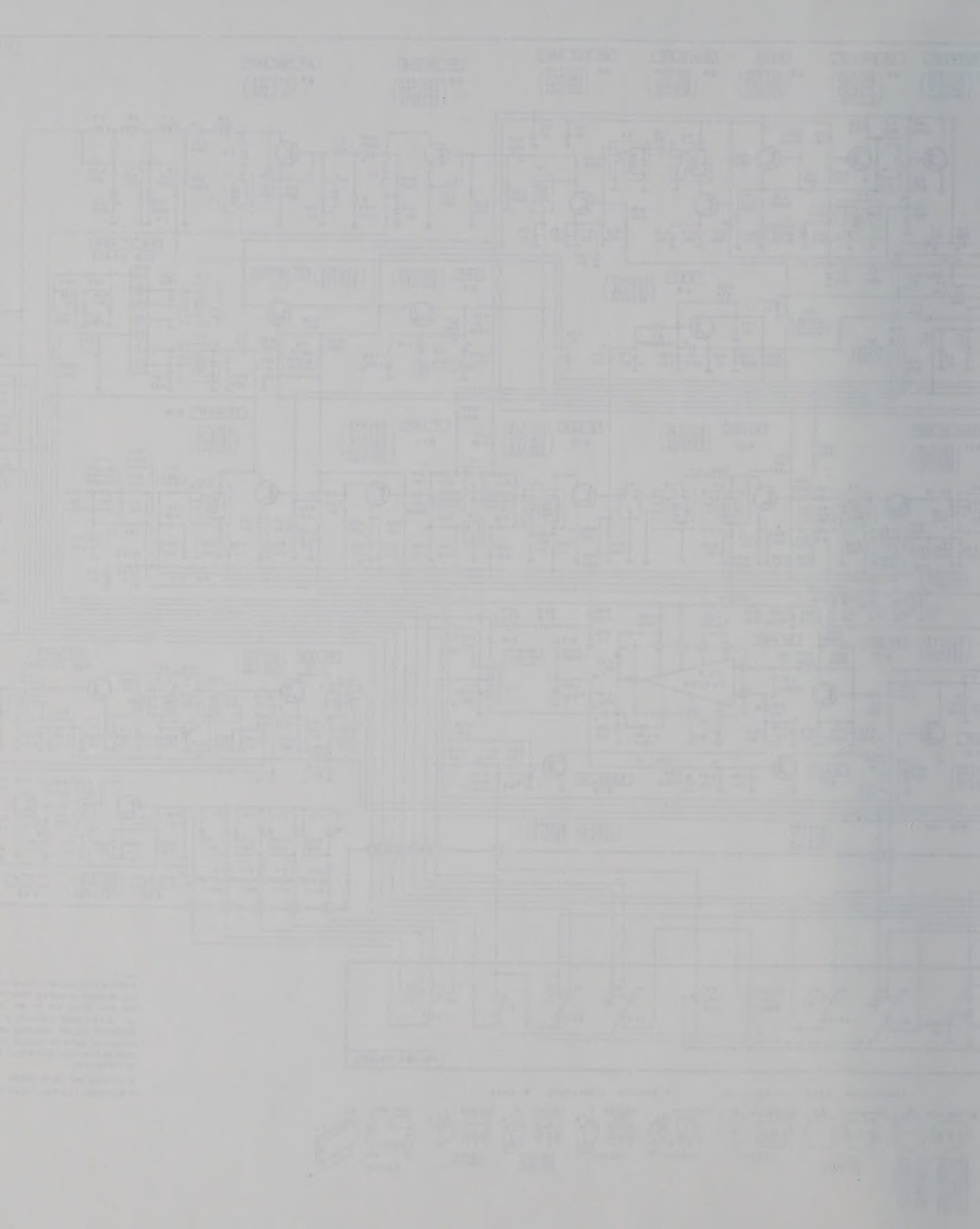
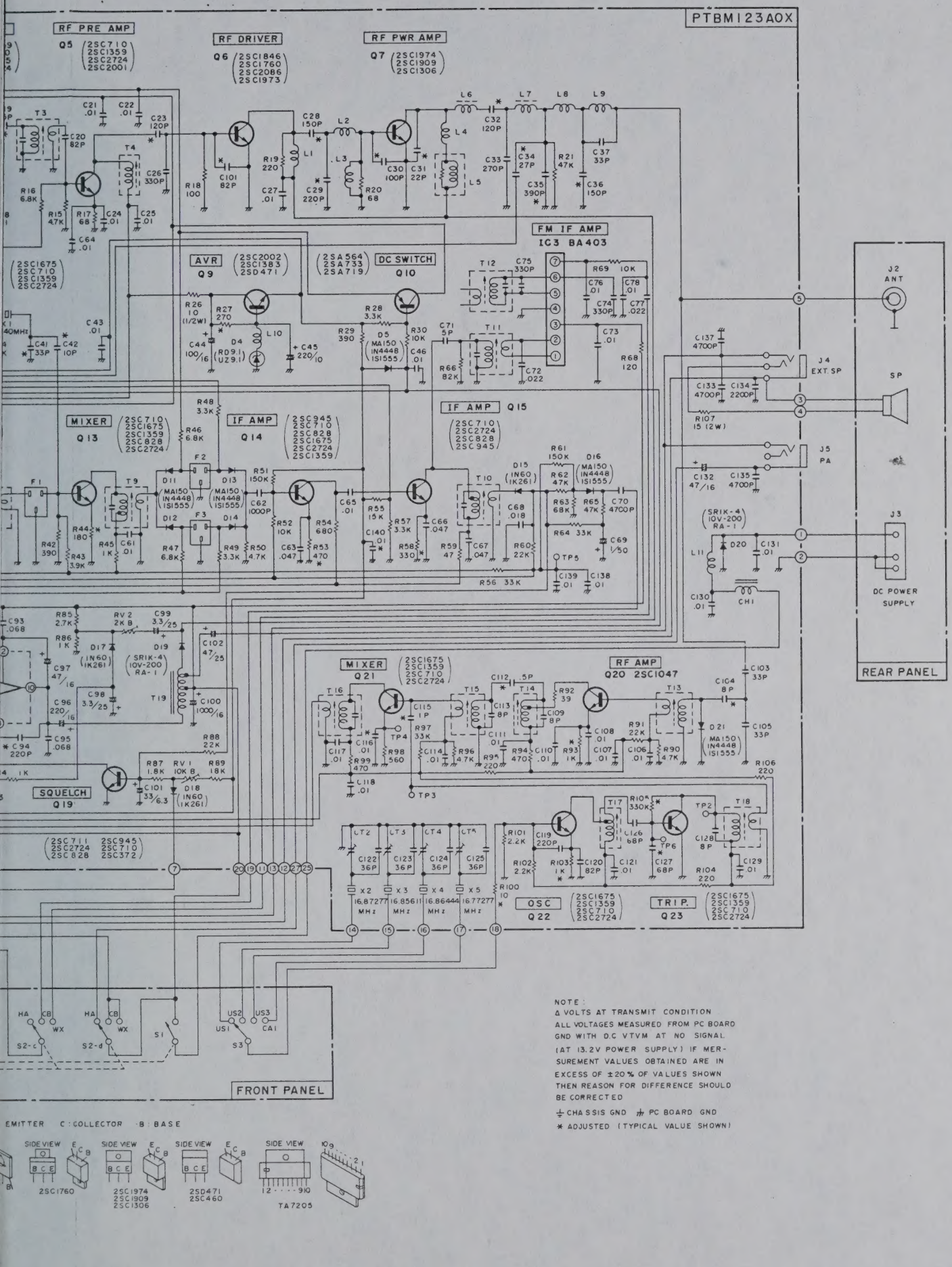
2SD471 2SC460


PTBM
BUFFER
Q1 (2SC1359 2SC1675 2SC710 2SC2724)
TX SWITCH
Q2 (2SC828 2SC1359 2SC2724 2SC1675 2SC710)
VCO
Q3 (2SC1359 2SC710 2SC1675 2SC2724)
DOUBLER
Q4 (2SC1359 2SC710 2SC1675 2SC2724)
RF PRE AMP
Q5 (2SC710 2SC1359 2SC2724 2SC2001)
RF DRIVER
Q6 (2SC1846 2SC1760 2SC2086 2SC1973)
RF PWR AMP
Q7 (2SC1974 2SC1909 2SC1306)
FM IF AMP
IC3 BA403
OSC
Q8 (2SC1675 2SC710 2SC1359 2SC2724)
AVR
Q9 (2SC2002 2SC1383 2SD471)
DC SWITCH
Q10 (2SA564 2SA733 2SA719)
27MHz RF AMP
Q11 (2SC710 2SC1047 2SC460 2SC2724)
MIXER
Q12 (2SC710 2SC1675 2SC829 2SC2724)
MIXER
Q13 (2SC710 2SC1675 2SC1359 2SC828 2SC2724)
IF AMP
Q14 (2SC945 2SC710 2SC828 2SC1675 2SC2724 2SC1359)
IF AMP Q15
(2SC710 2SC2724 2SC828 2SC945)
AF AMP
Q17 (2SC945 2SC828 2SC900 2SC1327)
AF PWR
IC2 TA7205
SW
Q16 (2SC828 2SC945 2SC372 2SC711)
ALC
Q18
SQUELCH
Q19
MIXER
Q21 (2SC1675 2SC1359 2SC710 2SC2724)
RF AMP
Q20 2SC1047
OSC
Q22 (2SC1675 2SC1359 2SC710 2SC2724)
TRIP.
Q23
(2SA564 2SA733 2SA719 2SA952)
(2SC711 2SC945 2SC2724 2SC710 2SC828 2SC372)
X2 16.87277 MHz
X3 16.85611 MHz
X4 16.86444 MHz
X5 16.77277 MHz
X1 10.240MHz
VOLUME VR1 50KA
SQ VR2 10KB
S1
S2-a
S2-b
S2-c
S2-d
S3
FRONT PANEL
NOTE :
Δ VOLTS AT TRANSMIT CONDITION
ALL VOLTAGES MEASURED FROM PC BOARD GND WITH D.C VTVM AT NO SIGNAL (AT 13.2V POWER SUPPLY) IF MEASUREMENT VALUES OBTAINED ARE IN EXCESS OF ±20% OF VALUES SHOWN THEN REASON FOR DIFFERENCE SHOULD BE CORRECTED
⏚ CHASSIS GND ⏚ PC BOARD GND
* ADJUSTED (TYPICAL VALUE SHOWN)
TRANSISTOR BASE INFORMATION
E : EMITTER C : COLLECTOR B : BASE
BOTTOM VIEW
SIDE VIEW
2SC1359 2SC828 2SC1973 2SC1383 2SA733 2SA952 2SC829 2SC900 2SC372
2SC1675 2SC2001 2SC2002 2SA564 2SA719 2SC1047 2SC945 2SC1327
2SC710 2SC2086 2SC711
2SC2724
2SC1846
2SC1760
2SC1974 2SC1909 2SC1306
2SD471 2SC460
TA7205




PTBM123A0X
RF PRE AMP
Q5 (2SC710 2SC1359 2SC2724 2SC2001)
RF DRIVER
Q6 (2SC1846 2SC1760 2SC2086 2SC1973)
RF PWR AMP
Q7 (2SC1974 2SC1909 2SC1306)
FM IF AMP
IC3 BA403
AVR
Q9 (2SC2002 2SC1383 2SD471)
DC SWITCH
Q10 (2SA564 2SA733 2SA719)
(2SC1675 2SC710 2SC1359 2SC2724)
MIXER
Q13 (2SC710 2SC1675 2SC1359 2SC828 2SC2724)
IF AMP
Q14 (2SC945 2SC710 2SC828 2SC1675 2SC2724 2SC1359)
IF AMP Q15
(2SC710 2SC2724 2SC828 2SC945)
MIXER
Q21 (2SC1675 2SC1359 2SC710 2SC2724)
RF AMP
Q20 2SC1047
SQUELCH
Q19
OSC
Q22 (2SC1675 2SC1359 2SC710 2SC2724)
TRIP.
Q23 (2SC1675 2SC1359 2SC710 2SC2724)
(2SC711 2SC2724 2SC828 2SC945 2SC710 2SC372)
J2 ANT
J4 EXT SP
SP
J5 PA
J3
DC POWER SUPPLY
REAR PANEL
FRONT PANEL
S1
S2-c
S2-d
S3
E:EMITTER C:COLLECTOR B:BASE
2SC1760
2SC1974 2SC1909 2SC1306
2SD471 2SC460
TA7205
NOTE:
Δ VOLTS AT TRANSMIT CONDITION
ALL VOLTAGES MEASURED FROM PC BOARD GND WITH D.C VTVM AT NO SIGNAL (AT 13.2V POWER SUPPLY) IF MEASUREMENT VALUES OBTAINED ARE IN EXCESS OF ±20% OF VALUES SHOWN THEN REASON FOR DIFFERENCE SHOULD BE CORRECTED
⏚ CHASSIS GND ⏚ PC BOARD GND
* ADJUSTED (TYPICAL VALUE SHOWN)